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NOTES ON THE DISTRIBUTION OF CERTAIN MAMMALS IN THE SOUTHEASTERN UNITED STATES.

BY ARTHUR H. HOWELL.

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In mapping the distribution of mammals in the southeastern States, particularly Georgia, Alabama and Mississippi, the Biological Survey has been handicapped by the lack of information on the ranges of many of the species. Parts of peninsular Florida and the coast region of Georgia have been examined and a full list of the mammals published by Outram Bangs.\* Portions of Tennessee have been studied by Samuel N. Rhoads, who has published an important contribution to the mammalogy of that State.† Considerable work has been done in North Carolina by Dr. C. Hart Merriam, the Brimley brothers, H. C. Oberholser, and others, and several brief local lists from the State have appeared.‡ Louisiana has been fairly well covered by the field parties of the Biological Survey, though most of the records are as yet unpublished. Collections have been made by the Survey in the coast region of Mississippi, Alabama, Georgia and South Carolina, but the interior of these four States is almost a blank, so far as our knowledge of the mammals is concerned.

With the purpose of extending our knowledge of the fauna of this region and to determine the boundaries of the life zones, a survey of parts of the southeastern States was carried on by the Biological Survey during the summer and fall of 1908. Between July 2 and November 24 I visited six States and made collections

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\* Proc. Boston Soc. Nat. Hist., XXVIII, pp. 157-235, 1898.

† Proc. Acad. Nat. Sci. Phila., 1896, pp. 175-205.

‡ See C. S. Brimley, "A Descriptive Catalogue of the Mammals of North Carolina, Exclusive of the Cetacea" < Journ. Elisha Mitchell Sci. Soc., XXI, pp. 1-32, 1905; H. C. Oberholser, "Notes on the Mammals and Summer Birds of Western North Carolina," 1905 (published by the Biltmore Forest School).

at more than 30 localities. In attempting to cover such a large area in a single season, the collecting of specimens was necessarily limited and the results of course are incomplete. So many new facts in regard to mammal distribution have been ascertained, however, that it seems desirable to publish at this time the more important discoveries, leaving a complete report on the region until additional field work has been prosecuted.

An examination was first made of the mountainous parts of northern Georgia. Between July 4 and July 20, the following localities were visited: Tate and Grassy Mountain (5 miles east of Jasper) in Pickens County; Ellijay and Rich Mountain in Gilmer County; and Young Harris and Brasstown Bald in Towns County. About ten days were spent in the region about Brasstown Bald, which is the highest mountain in the State (4,768 feet), and many important records were obtained there.\* The greater part of northern Georgia is included in the Upper Austral Zone. Transition Zone occurs on the mountain summits above 3,500 feet and a few Canadian Zone species were found on the extreme summit of Brasstown Bald.

Work was next carried on in the Cumberland Mountain region of eastern Kentucky and southwestern Virginia, July 23-29. The localities visited were Big Stone Gap, Virginia, and Big Black Mountain, Harlan Co., Kentucky. This mountain, the highest in the State, reaches an altitude of 4,100 feet and is probably the only peak in the range carrying any considerable area of Transition Zone. Tazewell and Burkes Garden, Virginia, were visited July 30 to August 7. One of the peaks of Rich Mountain, close to Tazewell, was examined and collections made both at the base and summit (4,230 feet).

Crossing the mountains at Cumberland Gap, I made a stop (August 9-13) at Barbourville, Kentucky, in the foothills of the Cumberland Range at 1,000 feet altitude. Proceeding southward into Tennessee I examined three localities on the Cumberland Plateau, as follows: High Cliff, Campbell County (about 3 miles east of Jellico), August 20-22; Briceville and Cross Mountain, August 14-22; and the southern end of Walden Ridge in the vicinity of Rathburn Station (Soddy P. O.), August 25-29.

Cross Mountain (3,550 feet) is the highest peak in the Cum-

\*A list of the birds and a description of the faunal characteristics of this region will be found in "The Auk," XXVI, pp. 129-137, April, 1909.

berland Range in Tennessee and supports a small area of Transition Zone above 3,000 feet. The same zone appears also at considerably lower altitudes in this range in shaded ravines having a northern exposure, as at High Cliff, along the north base of the Cumberland Escarpment, where Transition descends to about 1,000 feet altitude. Walden Ridge is a fairly level plateau varying in altitude from 1,600 to 2,400 feet, and extends from the vicinity of Chattanooga northeastward to Anderson County. It is included in the Upper Austral Zone, though a very few Transition species occur in small isolated areas in the cool gulches cut by the streams.

Northern Alabama was next examined, and collections were made at Scottsboro (September 1-3) and Huntsville (September 4-10). Lower Austral Zone extends up the Tennessee Valley in this State as far at least as Scottsboro. A short detour was made into West Tennessee to trace out the boundaries of this zone, which reaches east to western Lawrence County. Collections were made at Lawrenceburg (September 12-15) within the Upper Austral Zone.

In northern Mississippi short stops were made at Burnsville (September 16-18), Michigan City (September 22, 23), and Holly Springs (September 21). Practically the whole of Mississippi is included in the Lower Austral Zone, as shown by the presence in the northernmost counties of swamp rabbits, and of such characteristic trees as *Quercus nigra*, *Q. lyrata*, *Nyssa aquatica*, and *Taxodium distichum*.

In central and southern Alabama collections were made at the following localities: Reform, Pickens County (September 24-27; Talladega (September 28, 29); Auburn (October 1-5); Brewton (October 7, 8); Castleberry (October 9-13); Fairhope (October 16, 17); and Bon Secour (October 18-26). At the last mentioned place opportunity was afforded to visit the Gulf beach and study the peculiar fauna of that region.

A few days were spent in southeastern Louisiana, at Slidell (October 28-31) and Covington (November 2, 3), after which my work was confined to certain special investigations, first in the section of Mississippi occupied by the cotton boll weevil, and later in central Georgia, tracing out the ranges of the two swamp rabbits (*Lepus aquaticus* and *L. palustris*). The localities visited in Georgia were Abbeville (November 18), De Soto (November 19),

Lumpkin (November 20, 21), Preston (November 23), and Americus (November 24).

In addition to the records made personally on this trip, and on a previous trip in northern Louisiana in January and February, 1908, I have included in this report records of specimens in the Biological Survey Collection taken by other members of the staff, and of specimens in the National Museum Collection and the private collection of Dr. C. Hart Merriam which furnish additional information on the ranges of the species in the region under consideration.

### **Sciurus carolinensis** Gmelin.

#### SOUTHERN GRAY SQUIRREL.

The range of this squirrel includes nearly the whole of the southern States except southern Florida and the coast region of Louisiana. In the lowlands it is found almost exclusively in heavily-timbered swamps and in many places is still very abundant. In the mountainous districts it ranges less commonly to at least 4,500 feet altitude. It is extensively hunted in the fall and winter, and furnishes an important food supply.

The Biological Survey Collection contains a large number of specimens, all of the typical form, from various localities in the southern States, as follows:

- Tennessee*: Arlington, 7; Big Sandy, 17; High Cliff, Campbell County, 1.  
*Georgia*: Brasstown Bald, Towns County (4,500 feet alt.), 1; Grassy Mountain, 5 miles east of Jasper, 1; Lumpkin, 1.  
*Alabama*: Catherine, 1; Reform, 2; Hale County, 1; Castleberry, 3; Bon Secour, 4; Point Clear, Mobile Bay, 1.  
*Mississippi*: Michigan City, 3; Washington, 2; Bay St. Louis, 6.  
*Louisiana*: Mer Rouge, 3; Tallulah, 2.

### **Sciurus niger** Linnæus.

#### FLORIDA FOX SQUIRREL.

The northern and western limits of the range of this squirrel are not definitely known. It probably occupies, in addition to peninsular Florida, nearly all of southern Georgia and the coast region of the Carolinas. Bangs records a specimen from Columbus, Georgia.\* There are specimens in the National Museum from Nashville and Hogansville, Georgia—the former a typical specimen in the gray phase, the latter a black skin without skull. From the very scanty material now at hand, intergradation between *niger* and *texianus* can only be surmised. Intergradation does take place, however, between *niger* and *neglectus*, as shown by intermediate specimens in the National Museum from Accotink, Virginia.

\* Proc. Biol. Soc. Wash., X, p. 148, 1896.

**Sciurus niger texianus** Bachman.\*

## SOUTHERN FOX SQUIRREL.

Fox squirrels are becoming scarce in many parts of the South, and specimens are often difficult to obtain. A small series from the Cumberland Plateau in East Tennessee is referable to this form, though intermediate between *texianus* and *neglectus*. Of the five specimens examined, all but one have white noses. The color of the back is somewhat darker than in typical *neglectus* from Maryland, and the underparts are pale rufous instead of white. There is less black on the head than in typical *texianus*. A specimen from extreme northern Mississippi (Michigan City) also is referable to *texianus*, though probably grading toward *rufiventris*. This subspecies is thus seen to have an extensive range in the Southern States, from the lower Mississippi Valley northeastward to the Cumberland Mountains.

Specimens have been examined as follows:

*Tennessee*: High Cliff, Campbell County, 5.

*Mississippi*: Michigan City, 1.

*Alabama*: Castleberry, 1.

**Tamias striatus** (Linnæus).

## CAROLINIAN CHIPMUNK.

The range of the chipmunk in the Southern States includes practically all of Tennessee, western North Carolina, northern and western Georgia, and most of Alabama and Mississippi. Loomis records the species as abundant at Mount Pinnacle, Pickens County, South Carolina,† and Audubon and Bachman state that it occurs rarely at Columbia, S. C., but is not found nearer the seaboard than that point.‡ The same authors speak of it as occurring throughout Louisiana, and (on page 69) mention capturing a specimen in that State, but no other records of its occurrence there have been found. It is apparently absent from the coast region of Mississippi, Alabama and Georgia.§

Although reported by the residents to be numerous at many localities in the States visited, particularly in the mountainous portions, very few of the animals were actually met with. Records have been secured of their occurrence at the following localities:

*Kentucky*: Clover Fork, Harlan County (common; specimen taken).

*Tennessee*: High Cliff, Campbell County (reported); Coal Creek, Anderson County (one seen); Walden Ridge, near Soddy, Hamilton County (reported).

*Georgia*: Young Harris (common; three specimens); Rich Mountain, near Ellijay (one seen at 4,000 feet); Grassy Mountain, near Jasper (several seen); Atlanta (one seen in the city park); Preston (one seen, November 22).

\* Defined by Osgood, Proc. Biol. Soc. Wash., XX, pp. 46-47, 1907.

† Auk, VII, p. 33, 1890.

‡ Quad. N. Am., I, p. 73, 1849.

§ Dr. C. Hart Merriam has recorded (Am. Nat., XX, p. 238, 1886) a specimen from Charleston, S. C. This specimen can not now be found, and it seems likely that there is some error connected with the record.

*Alabama*: Huntsville (reported to occur on Monte Sano); Rebecca Mountains, ten miles south of Talladega (one specimen)\*; Greensboro (five specimens); Garland (reported); Castleberry (reported).

*Mississippi*†: Michigan City (reported to occur about five miles southwest); Washington (two specimens); Natchez (one seen, November 15).

***Marmota monax* (Linnæus).**

WOODCHUCK; GROUND-HOG.

The range of the woodchuck was found to extend south along the mountains into northern Georgia and Alabama. It is fairly numerous throughout the Cumberland Plateau and extends west in Tennessee at least as far as Fayetteville. It has once been recorded from western South Carolina (Mt. Pinnacle, Pickens County ‡). As stated by Audubon and Bachman, "it is not found in the maritime districts of either North or South Carolina." Records were secured of its occurrence at the following localities:

*Tennessee*: High Cliff, Campbell County (one specimen); Cross Mountain, Anderson County (reported common); Walden Ridge, near Soddy (common); ridge between Fayetteville and Pulaski (reported).

*Georgia*: Young Harris (common on the mountains up to 4,500 feet; one specimen); Grassy Mountain, ten miles east of Jasper (common).

*Alabama*: Monte Sano, near Huntsville (reported scarce).

***Sciuropterus volans querceti* Bangs.**

SOUTHERN FLYING SQUIRREL.

Flying squirrels are quite generally distributed in the South. This subspecies, only slightly differentiated from typical *volans*, ranges from Florida to the Mississippi Valley and north at least to Kentucky and Tennessee. Specimens have been examined from the following localities:

*Kentucky*: Eubanks, 3 (collection of C. Hart Merriam); Hickman, 1.

*Tennessee*: Watauga Valley, 2.

*South Carolina*: Cleora, Edgefield County, 1.

*Georgia*: Young Harris, 1.

*Alabama*: Greensboro, 2.

*Mississippi*: Washington, 1; Columbus, 1 (U. S. N. M. Coll.)

*Louisiana*: Prairie Mer Rouge, 1 (U. S. N. M. Coll.).

***Peromyscus maniculatus nubiterræ* Rhoads.**

CLOUDLAND WHITE-FOOTED MOUSE.

The range of this form was ascertained to extend southward along the high summits of the Blue Ridge (above 4,000 feet) into Georgia. It was taken also in Virginia. Specimens were secured from the following localities:

\* This specimen is much paler and grayer than typical *striatus* from northern Georgia and western North Carolina, and shows an approach to *T. s. griseus*; the Greensboro specimens, on the other hand, are very dark and richly colored.

† Allison reports chipmunks common in the Tennessee Valley in Tishomingo County (Auk, XXIV, p. 13, 1907).

‡ Loomis, Auk, VII, p. 33, 1890.

*Virginia*: Rich Mountain, near Tazewell (4,100 feet altitude), 1.

*Georgia*: Brasstown Bald (4,300-4,750 feet), 12.

***Peromyscus polionotus* subsp.\***

BEACH MOUSE.

This handsome little mouse, previously known from Whitfield, Florida, was found to be common on the white sand dunes along the outer beach near Bon Secour, Alabama, where six specimens were secured. Their tracks were seen everywhere on the sand, where the little animals run about in the scattered clumps of stunted live oak bushes.

***Sigmodon hispidus* Say and Ord.**

COTTON RAT.

This species, while mainly confined to the Lower Austral Zone, was taken on this trip in northern Georgia at the foot of the mountains (2,000 feet altitude), well within the Upper Austral. It was taken also in Tennessee for the first time.

Specimens were secured at the following localities:

*Georgia*: Young Harris, 3 (common).

*Tennessee*: Soddy (Rathburn Station), 1.

*Alabama*: Huntsville, 1; Auburn, 3; Bon Secour, 4.

*Louisiana*: Leconte, 4.

***Oryzomys palustris* (Harlan).**

RICE RAT.

This species has been supposed to be confined mainly to the coast region of the South Atlantic and Gulf States. It was a great surprise, therefore, when I trapped specimens at the foot of the Cumberland Mountains in eastern Kentucky and eastern Tennessee. The records now at hand indicate that it pushes into the interior along the streams well within the Upper Austral Zone. In view of these facts, there seems to be no further need to doubt the authenticity of the specimens collected by Goss at Neosho Falls, Kansas. †

The rice rats were caught in small marshes in the river bottoms, and in some cases in dry cultivated fields or in ditches along the railroad tracks. They were particularly abundant in the marshes on the coast of Alabama. Their characters are remarkably uniform over their extensive range.

Specimens are at hand from the following localities:

*Kentucky*: Barbourville, 3.

*Tennessee*: High Cliff, Campbell County, 1; Lawrenceburg, 2; Arlington, Shelby County, 1.

*Alabama*: Huntsville, 4; Reform, Pickens County, 1; Bon Secour, 3; Montgomery, 1; Gallion, 1; Ehnore, 1.

*Mississippi*: Fayette, 1.

\* This new form will be described by Osgood in *N. Am. Fauna*, No. 28, now in press.

† See Coues, *Monog. N. Am. Rodentia*, p. 117, 1877; Lantz, *Trans. Kans. Acad. Sci.*, XX, Pt. II, p. 216, 1907.

**Neotoma pennsylvanica** Stone.

ALLEGHENY CAVE RAT.

This species, known previously from New York to Virginia and Kentucky (Mammoth Cave), and provisionally reported from North Carolina\* and Alabama,† was taken at three localities in southern Tennessee and northern Alabama, and indications of its presence were found as far south as Talladega, Alabama. No signs of them were discovered in Georgia, but the mountainous portions of the State are well suited to their habits and they will probably be found to occur locally. They were taken as high as 4,000 feet in Virginia, and as low as 800 feet in Tennessee (Lawrenceburg). It is strictly a cliff rat and is likely to be found in rocky bluffs or caves throughout the Transition and Upper Austral Zones.

Records were obtained of their occurrence at the following localities:

*Virginia*: Rich Mountain (at 4,000 feet) near Tazewell (abundant in crevices and caves in the cliffs at the summit; 4 specimens).

*Tennessee*: Walden Ridge, near Soddy (numerous signs found about rocky bluffs; 1 specimen); Lawrenceburg (abundant in bluffs along creek; 1 specimen).

*Alabama*: Monte Sano, east of Huntsville (common in caves on the mountain at 1,500 feet; 2 specimens); Rebecca Mountains, 10 miles south of Talladega (old signs seen about cliffs at 1,800 feet).

**Evotomys carolinensis** Merriam.

CAROLINA RED-BACKED MOUSE.

This handsome mouse was found to be numerous in a cool, shaded ravine in Big Stone Gap, Virginia, where three specimens were trapped July 28 and 29. Efforts were made to secure them on the mountains of northern Georgia, but although traps were set in suitable places for several nights, none was caught.

**Microtus pinetorum auricularis** Bailey.

BLUEGRASS VOLE.

Specimens have been received by the Biological Survey from the following localities:

*Tennessee*: High Cliff, Campbell County, 2; Watanga Valley, 1.

**Microtus pinetorum nemoralis** Bailey.

WOODLAND VOLE.

Two specimens taken at Mansfield, Louisiana, January 25, 1908, are intermediate between *auricularis* and *nemoralis*, but seem nearer to the latter form. The skulls agree with those of *nemoralis*, but the hind feet are somewhat shorter.

**Fiber zibethicus** (Linnaeus).

MUSKRAT.

The Muskrat ranges in the South through upper South Carolina and the northern parts of Georgia, Alabama and Mississippi. As stated by

\* Rhoads, Proc. Acad. Nat. Sci., Philadelphia, 1896, p. 192.

† Rhoads, Journ. Cincinnati Soc. Nat. Hist., XIX, p. 53, 1897.



Audubon and Bachman\* it is absent from the alluvial lands in Carolina, † Georgia, Alabama and Florida. Although recorded by the same authors as existing "in the mountains of Georgia, and the higher portions of Alabama," practically nothing more has been published on the range of the species in those States. ‡ The only published records from South Carolina are likewise those of Audubon and Bachman, who state that they "have obtained it from Aikin, and St. Matthew's parish, on the Congaree River, but have never found traces of it nearer the sea than seventy miles from Charleston." While in South Carolina in November, 1905, I learned of the presence of muskrats at Cleora, Edgefield County, a few miles above Aikin.

Following is a list of the localities in the Southern States where this species is known to occur:

*Tennessee*: High Cliff, Campbell County (common; four specimens); Watanga Valley (one specimen); Briceville (reported numerous).

*Georgia*: Young Harris (reported common); Hogansville (specimen in U. S. National Museum).

*Alabama*: Scottsboro (reported); Huntsville (reported common); Reform (scarce; one specimen).

*Mississippi*: Michigan City (numerous; several seen).

### **Fiber zibethicus rivalicius** Bangs.

#### LOUISIANA MUSKRAT.

This form has a very restricted range in the coast region of Louisiana. They are abundant in the marshes bordering Lake Pontchartrain, but at Covington, less than ten miles north of the lake, are unknown to the people and apparently do not occur. There are no muskrats in the marshes at Bon Secour, Alabama, on the east side of Mobile Bay, nor do they occur at Castleberry, Alabama, fifty miles back from the coast. A specimen of this form taken at Slidell, Louisiana, is in the National Museum.

### **Lepus aquaticus** Bachman.

#### SWAMP RABBIT.

The northward limits of the range of this rabbit mark the boundary of the Lower Austral Zone. Special efforts were made, therefore, to determine the extent of its range. It occupies practically all of Mississippi and the greater part of Alabama, pushing up the Tennessee Valley as far as Scottsboro, Alabama, and reaches as far east in Tennessee as Henryville, Lawrence County. It penetrates extreme western Georgia into Stewart and Webster Counties, and a few miles east of Preston meets the range of *L. palustris*. It is apparently absent from the immediate coast region of Alabama.

\*Quad. N. Am., I, p. 123, 1849.

† It occurs on the northern coast of North Carolina as far south at least as Hyde County, whence it has been reported by Brimley (Journ. Elisha Mitchell Sci. Soc., XXI, p. 12, March, 1905).

‡ R. W. Smith, in a list of the birds of Kirkwood, Georgia, mentions the muskrat as occurring rarely at that place (Wilson Bull., X, p. 51, 1903).

Records were secured of its occurrence at the following localities:

*Tennessee*: Henryville (reported to be found sparingly at this point, probably ranging up Buffalo Creek from the Tennessee River).

*Mississippi*: Michigan City (abundant).

*Alabama*: Huntsville (common; three specimens); Scottsboro (reported scarce); Reform (abundant; five specimens); Auburn (common; six specimens); Castleberry (common; four specimens); Brewton (common).

*Georgia*: Lumpkin (fairly common; one specimen); Preston (reported scarce).

*Louisiana*: Covington (three specimens).

### **Lepus palustris** Bachman.

EASTERN MARSH RABBIT.

The western limit of the range of this rabbit is in the vicinity of Americus, Georgia. On Kinchatoonee Creek, a few miles west of Americus, *Lepus aquaticus* is the prevailing species. *L. palustris* reaches the coast of Alabama, where it is abundant in the wet salt marshes bordering Mobile Bay. In central Georgia the same species lives under a very different environment—in the comparatively dry, open swamps which are found in the shallow depressions in the pine forests.

Specimens were secured at the following localities:

*Georgia*: Americus, 2; Abbeville, 5.

*Alabama*: Bon Secour, 2.

### **Lepus floridanus transitionalis** Bangs.

TRANSITION COTTONTAIL.

This form, known previously from New England, New York and Pennsylvania, was taken on Brasstown Bald, in northern Georgia. A single specimen was secured, July 16, at 4,600 feet altitude, and later two specimens, taken December 6 on the lower slopes near Young Harris, were received from a collector residing there. These have been identified by E. W. Nelson.

### **Lepus floridanus mallurus** Thomas.

EASTERN COTTONTAIL.

This form occupies eastern and southern Georgia and reaches Alabama in the Mobile Bay region. Specimens taken at the following localities have been identified by E. W. Nelson:

*Georgia*: Abbeville, 4; De Soto, 1; Americus, 1; Lumpkin, 2.

*Alabama*: Bon Secour, 1.

### **Lepus floridanus alacer** Bangs.

BANGS COTTONTAIL.

This subspecies is found over the whole of Mississippi and the greater part of Alabama, and penetrates northwestern Georgia as far as the foot of the mountains. Whether or not it ranges on to the mountains was not determined. Specimens were taken at the following localities:

*Georgia*: Tate, 1.

*Alabama*: Huntsville, 3; Scottsboro, 1; Auburn, 1; Castleberry, 3.

*Mississippi*: Michigan City, 1; Holly Springs, 1; Fayette, 1.

**Lepus floridanus mearnsi** Allen.

MEARNS COTTONTAIL.

A specimen of this form was received from a collector at High Cliff, Campbell Co., Tenn. No specimens were secured at other points in East Tennessee, but this subspecies probably ranges over the Cumberland Plateau.

**Lynx ruffus** (Güldenstaedt).

EASTERN LYNX.

Lynxes are common on the upper slopes of Brasstown Bald, Georgia, where the dense rhododendron thickets and rocky cliffs afford a congenial habitat. A half-grown kitten was trapped close to our camp at 4,300 feet and a larger individual, caught near the summit, broke away with the trap and was lost. Lynxes occur throughout much of the wilder parts of the South, but no other specimens were secured.

**Mephitis putida** Boitard.

EASTERN SKUNK.

The large skunks are quite generally distributed in the Southern States, but on account of the lack of specimens the ranges of the two forms occurring there (*putida* and *elongata*) can not be defined. Specimens recently examined from western Alabama (Reform) are referable to *putida*, though the skulls show some approach to *elongata* in their characters. The latter form occurs in eastern Georgia and on the coast of Alabama and Mississippi.

Specimens have been examined as follows:

*Tennessee*: High Cliff, Campbell County, 1.

*Alabama*: Reform, 3.

**Spilogale putorius** (Linnaeus).

ALLEGHENIAN SPOTTED SKUNK.

These little skunks are much less common in the South than their larger relatives, and in many places are unknown to the residents. Records were secured of their occurrence at the following localities:

*Georgia*: Brasstown Bald, Towns County (common, 1 specimen, 4,000 feet alt.); Grassy Mountain, east of Jasper (reported common).

*Tennessee*: High Cliff, Campbell County (1 specimen); Briceville (reported scarce).

*Alabama*: Reform (reported); Castleberry (reported).

**Putorius noveboracensis** Emmons.

NEW YORK WEASEL.

This species is common in the mountains of North Carolina and there are numerous records from that State. Rhoads says it is reported to be common in West Tennessee,\* but gives no definite records, nor are there

\* Proc. Acad. Nat. Sci. Phila., 1896, p. 198.

any records of the species from farther south than North Carolina. A skin, without skull, taken at High Cliff, Campbell County, Tennessee, has been received by the Biological Survey.

Weasels were reported to me as occurring rarely at Reform and Castleberry, Alabama, but whether of this species or not is uncertain. Reports have been received also from W. J. Hoxie, of the capture of a weasel at Quitman, Georgia, and another near Savannah. These should doubtless be referred to *P. peninsulæ*.

**Sorex fumeus** Miller.

SMOKY SHREW.

This species, known previously from as far south as Roan Mountain, North Carolina, was obtained on the summit of Brasstown Bald, Georgia (one specimen, ♂, July 16), and at High Cliff, Tennessee (one specimen, ♀, August 21). The specimen taken on Brasstown Bald was trapped in a dense growth of rhododendron, at the base of a cliff, at 4,700 feet altitude. The one from High Cliff was caught at 1,000 feet altitude, in a damp, heavily-timbered ravine, near the base of the north escarpment of Pine Mountain.

**Sorex longirostris** Bachman.

CAROLINA SHREW.

This diminutive species is very rare in collections, and has been recorded from only a few localities, in North and South Carolina. A specimen recently received from Young Harris, Georgia, is the first known from that State and extends the known range of the species into the Upper Austral Zone. The tail of this specimen measured (in the flesh) 32 mm., and the hind foot 10 mm. Another specimen in the Biological Survey, from Bicknell, Indiana, indicates that the species ranges into the Mississippi Valley.

**Blarina brevicauda** (Say).

LARGE BLARINA.

A single specimen of this shrew was taken, July 20, in a wet meadow at Young Harris (altitude 1,900 feet). It is intermediate between *brevicauda* and *carolinensis*, but seems nearer to the former. Its skull is about the size of skulls of *brevicauda* from the District of Columbia, but in external measurements it is somewhat smaller than those specimens.

**Blarina brevicauda carolinensis** (Bachman).

CAROLINA BLARINA.

Although recorded from both Mississippi\* and Texas,† there appears to be no published record of this shrew from Louisiana. I took four specimens in the State in January, 1908—three at Natchitoches and one at Mansfield.

**Blarina parva** (Say).

SMALL BLARINA.

This species apparently ranges quite generally through the Southern

\* N. Amer. Fauna, No. 10, p. 14, 1895.

† N. Amer. Fauna, No. 25, p. 207, 1905.

States, but records of its occurrence are few and scattering.\* A single specimen was taken at Belcher, Louisiana, February 6, 1908.

**Scalopus aquaticus** (Linnaeus).

EASTERN MOLE.

Moles are quite generally distributed through the Southern States and are particularly numerous where the soil is light or sandy. On Brasstown Bald, Georgia, their runways were seen frequently all the way up the slope from the base to about 4,500 feet altitude.

Records are at hand of their occurrence at the following localities:

*Kentucky*: Barbourville (scarce; few runways seen).

*Tennessee*: Briceville (reported to occur); Walden Ridge, near Soddy (scarce).

*Alabama*: Huntsville (common; one specimen); Auburn (scarce); Castleberry (scarce); Bon Secour (scarce).

*Georgia*: Young Harris (common; five specimens); Crawfordville (one specimen); Americus (common).

*Louisiana*: Shreveport (common; three specimens); Clarks (one specimen); Natchitoches (one specimen).

**Myotis grisescens** Howell. †

GRAY BAT.

A large colony of these bats inhabit Nickajack Cave, near Shellmound, Tennessee, where I secured a series of 81 specimens on August 31. The species has been taken also at Marble Cave, Stone County, Missouri, and at Twin Cave, near Mitchell, Indiana. It will probably be found in most of the large caves in Tennessee, Kentucky, and other southern States. There is said to be a cave near Lim Rock, Alabama, inhabited by large numbers of bats—probably of this species.

**Myotis subulatus** (Say).

SAY'S BAT.

A single specimen of this bat, taken April 6, 1909, in a cave on Ivy Log Mountain, near Young Harris, Georgia, has been received by the Biological Survey. This is the first record of the species from the State.

**Pipistrellus subflavus** (F. Cuvier).

GEORGIAN BAT.

This is one of the most abundant and widely distributed bats in the South. Specimens were taken at the following localities:

*Tennessee*: Briceville (6, August 14, 17, 18); Soddy (2, August 25).

*Georgia*: Young Harris (1, July).

*Alabama*: Huntsville (1, September 8).

**Eptesicus fuscus** (Beauvois).

LARGE BROWN RAT.

Although of wide distribution in the United States, there are few records

\* See N. Amer. Fauna, No. 10, p. 18, 1895.

† For original description, see Proc. Biol. Soc. Wash., XXII, pp. 45-47, 1909.

of its occurrence in the Southern States. Specimens were taken at the following localities:

*Virginia*: Tazewell (common; 1, August 4).

*Tennessee*: Soddy (1, August 25).

*Georgia*: Young Harris (2, July 10).

***Lasiurus borealis* (Müller).**

RED BAT.

This bat ranges over most of the Southern States, and in many places is very common. Specimens were taken at the following localities:

*Georgia*: Young Harris (1, July 13).

*Tennessee*: Briceville (2, August 18); Coal Creek (1, August 19).

***Nycticeius humeralis* (Rafinesque).**

RAFINESQUE BAT.

Specimens of this southern species are in the Biological Survey Collection from the following localities:

*Alabama*: Castleberry (1, October 12); Bon Secour (1, October 19); Greensboro (1, July 30, 1892); Point Clear, Mobile Bay (3, April 19, 20, 1892).

***Corynorhinus macrotis* (Le Conte).**

BIG-EARED BAT.

Although this species apparently does not range north of the Lower Austral Zone on the Atlantic coast, it pushes up into the mountains to the upper edge of the Upper Austral. It has been recorded from Weaverville, North Carolina, and from the Pink Beds, Pisgah Forest, at 3,300 feet.\*

I found the species in August at Burkes Garden, Virginia, at 3,200 feet altitude. An examination of four large caves and several small ones in this valley resulted in finding only ten or fifteen bats of this species in one of the larger caves. These caves are all in open pastures, the entrances being circular depressions in the surface of the field. The cave in which the bats were found was moist and cool, but contained no water. A single specimen of this bat was taken on Monte Sano, near Huntsville, Alabama, at an altitude of 1,600 feet. It was roosting in a small stone gate-house and was dislodged by a smudge built in the house, the smoke causing it to fall to the floor in a semi-conscious condition.

Specimens of this bat from the following localities have been examined:

*Virginia*: Burkes Garden (5, August 7).

*Georgia*: Young Harris (1, March 30, 1909).

*Alabama*: Monte Sano, near Huntsville (1, September 5).

*Mississippi*: Westville (1, head only, U. S. N. M. Coll.).

*Louisiana*: Lobdell (1, March 4, 1903, U. S. N. M. Coll.); Tallulah (2, February 23, 1905).

\* H. C. Oberholser, *Mamm. West. North Carolina*, p. 9, 1905.